FLOOD INSURANCE STUDY

TOWN OF WESTERLO, NEW YORK
ALBANY COUNTY

AUGUST 3, 1989

Federal Emergency Management Agency

COMMUNITY NUMBER - 360017

NOTICE TO
FLOOD INSURANCE STUDY USERS

Communities participating in the National Flood Insurance Program (NFIP) have established repositories of flood hazard data for floodplain management and flood insurance study purposes. This Flood Insurance Study (FIS) may not contain all data available within the repository. It is advisable to contact the community repository for any additional data.

TABLE OF CONTENTS

		Page
1.0	INTRODUCTION	1
	1.1 Purpose of Study	1
	1.2 Authority and Acknowledgments	1
	1.3 Coordination	1
2.0	AREA STUDIED	2
	2.1 Scope of Study	2
	2.2 Community Description	2
	2.3 Principal Flood Problems	4
	2.4 Flood Protection Measures	4
3.0	ENGINEERING METHODS	4
	3.1 Hydrologic Analyses	4
	3.2 Hydraulic Analyses	7
4.0	FLOODPLAIN MANAGEMENT APPLICATIONS	8
	4.1 Floodplain Boundaries	8
	4.2 Floodways	9
5.0	INSURANCE APPLICATIONS	13
6.0	FLOOD INSURANCE RATE MAP	15
7.0	OTHER STUDIES	15
8.0	LOCATION OF DATA	16
9.0	BIBLIOGRAPHY AND REFERENCES	16

TABLE OF CONTENTS - continued

Page

FIGURES

Figure 1 - Vicinity Map 3

Figure 2 - Floodway Schematic 13

TABLES

Table 1 - Summary of Discharges 5 - 7

Table 2 - Floodway Data 10 - 12

EXHIBITS

Exhibit 1 - Flood Profiles
Basic Creek Panels 01P-09P
Eightmile Creek Panel 10P-13P
Hannacrois Creek Panel 14P-17P

Exhibit 2 - Flood Insurance Rate Map Index and Street Index
Flood Insurance Rate Map

Exhibit 3 - Elevation Reference Marks

FLOOD INSURANCE STUDY
TOWN OF WESTERLO, ALBANY COUNTY, NEW YORK

1.0 INTRODUCTION

1.1 Purpose of Study

This Flood Insurance Study investigates the existence and severity of flood hazards in the Town of Westerlo, Albany County, New York, and aids in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. This study has developed flood risk data for various areas of the community that will be used to establish actuarial flood insurance rates and assist the community in its efforts to promote sound floodplain management. Minimum floodplain management requirements for participation in the National Flood Insurance Program (NFIP) are set forth in the Code of Federal Regulations at 44 CFR, 60.3.

In some states or communities, floodplain management criteria or regulations may exist that are more restrictive or comprehensive than the minimum Federal requirements. In such cases, the more restrictive criteria take precedence and the state (or other jurisdictional agency) will be able to explain them.

1.2 Authority and Acknowledgments

The sources of authority for this Flood Insurance Study are the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

The hydrologic and hydraulic analyses for this study were prepared by McCoy-Jackson Associates for the Federal Emergency Management Agency (FEMA), under Contract No. EMW-84-C-1603. This work was completed in June 1987.

1.3 Coordination

In March 1984, an initial Consultation and Coordination Officer's (CCO) meeting was held with representatives of FEMA, the town, and McCoy-Jackson Associates (the study contractor) to determine the streams to be studied by detailed methods.

Information concerning the history of flooding in the study area was provided by Town of Westerlo officials and residents, and the U. S. Geological Survey (USGS).

On September 9, 1988, a final CCO meeting was held with representatives of FEMA, the town, and the study contractor to review the results of the study.

2.0 AREA STUDIED

2.1 Scope of Study

This Flood Insurance Study covers the incorporated area of the Town of Westerlo, Albany County, New York. The area of study is shown on the Vicinity Map (Figure 1).

The following streams were studied by detailed methods: Basic Creek, from the downstream corporate limits to a point approximately 340 feet downstream of State Route 85; Eightmile Creek, from the downstream corporate limits to a point approximately 1,725 feet upstream of County Route 402 (Medusa Road); and Hannacrois Creek, for its entire length within the community. The areas studied by detailed methods were selected with priority given to all known flood hazard areas and areas of projected development and proposed construction through June 1992.

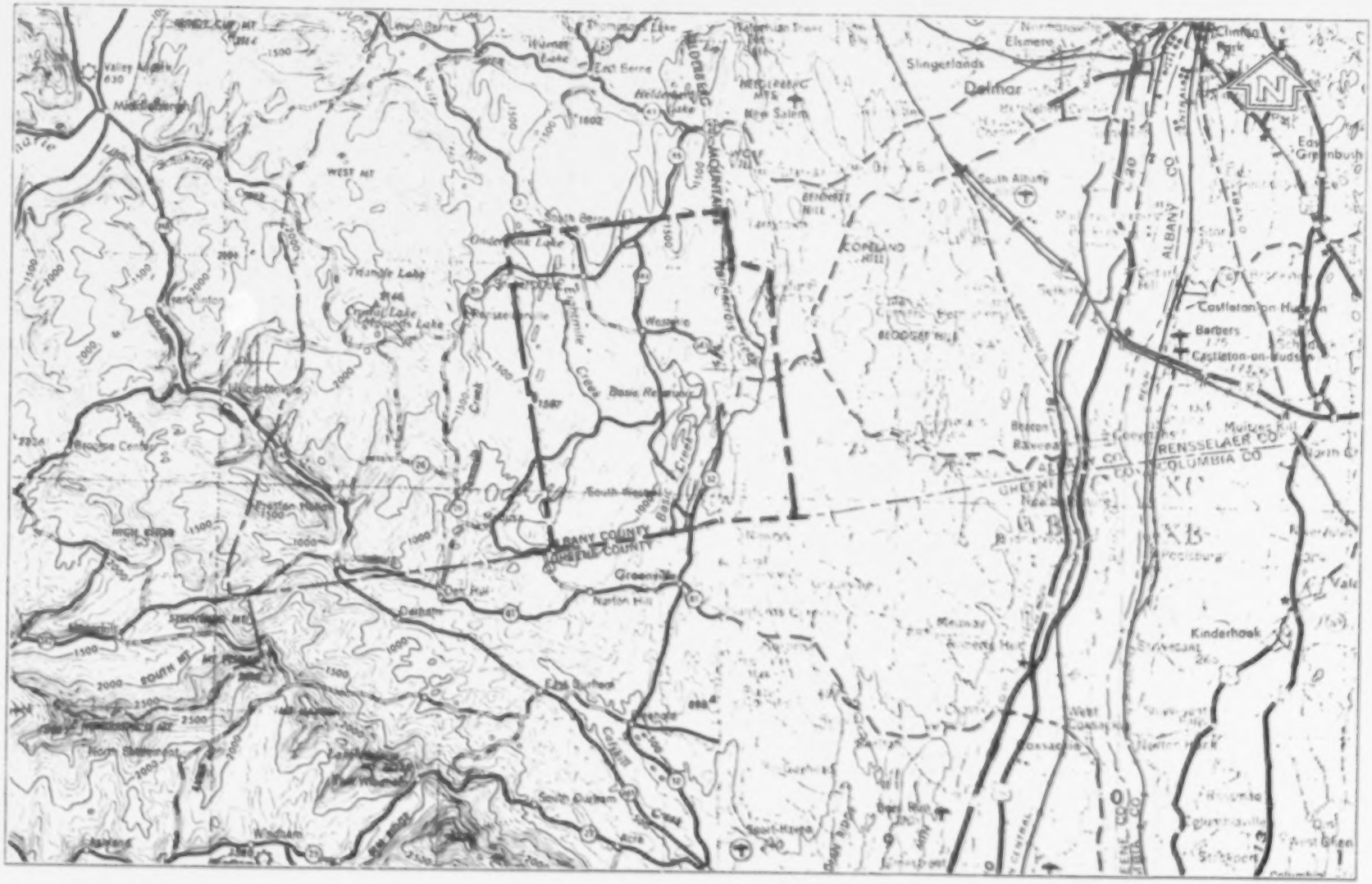
The following streams were studied by approximate methods: Silver Creek, Gulf Creek, and several unnamed tributaries within the community. Approximate analyses were used to study those areas having a low development potential or minimal flood hazards. The scope and methods of study were proposed to, and agreed upon by, FEMA and the Town of Westerlo.

2.2 Community Description

The Town of Westerlo is located in the southeast portion of Albany County in the capital district of New York State. The Town of Westerlo is bordered by the Town of Berne to the north, the Town of New Scotland to the northeast, the Town of Coeymans to the east, the Town of Greenville to the south, the Town of Durham to the southwest, and the Town of Rensselaerville to the west. The town occupies an area of approximately 60 square miles. In 1980, the population of the town was 3,106 (Reference 1).

Basic Creek flows in a southern direction through the center of the town and has an average slope of approximately 50 feet per mile. Eightmile Creek flows in a southern direction through the western portion of the town and has an average slope of approximately 70 feet per mile. Hannacrois Creek flows in a southeastern direction through the eastern portion of the town into the Alcove Reservoir and has an average slope of approximately 70 feet per mile.

The climate of the Town of Westerlo is characterized by moderately warm summers and cold winters. The mean July temperature is approximately 73 degrees Fahrenheit ($^{\circ}$F), while the mean January temperature is approximately 29°F. The mean annual precipitation over the area is approximately 37.0 inches. Precipitation in the


Slingerlands
Delmar
Elsmere
Clinton Park
East Greenbush
South Albany
Castleton-on-Hudson
Barbers
Bloodgood Hill
Kinderhook
RENSSELAER CO
COLUMBIA CO
ALBANY CO
Greenville
Norton Hill
Durham
South Durham
Westerlo
Onesquethaw Creek
Basic Creek
Catskill Creek
Coeymans
Beacon
Muitzes Hill
Vale
Valley Heights
Middleburgh
Lake Berne
Warner Lake
East Berne
Helderberg Lake
Helderberg Mts
New Salem
Wolf Hill
Helderberg Mountains
Onesquethaw Lake
Triangle Lake
Crystal Lake
Dutch Lake
Meadow Lake
Preston Corners
Preston Hollow
Becraft Mt
Becraft Creek
Basic Reservoir
Coeymans Hollow
Coeymans Creek
Hudson River
Greene Co
Albany County
Greene County
West Durham
Durham Center
Durham Mt
Mt Pisgah
South Mt
Mt Hope
Hayes Mt
Rock Hill
Rock Hill Mt
Stony Hollow Mt
Stony Hollow
Gayhead
Gayhead Mt
Gayhead Creek
Gayhead Reservoir
North Settlement
Settlement
Settlement Creek
Settlement Reservoir
Ashland
Windham
Ashland Creek
Ashland Reservoir
Ashland Mt
Windham Mt
Windham Creek
Windham Reservoir
Batavia Kill
Batavia Kill Reservoir
Batavia Kill Creek
Kaaterskill Creek
Kaaterskill Reservoir
Kaaterskill Mt
Kaaterskill Clove
Kaaterskill Clove Creek
Kaaterskill Clove Reservoir
Kaaterskill Clove Mt
Kaaterskill Clove Mt
Kaaterskill Clove Creek
Kaaterskill Clove Reservoir

form of snowfall and sleet occurs mainly in the months of December through March with an average annual snowfall of approximately 43 inches (Reference 2).

2.3 Principal Flood Problems

Flooding can occur in the study area during all seasons, but generally the most notable floods have occurred between the months of February and April when snowmelt adds to heavy spring rains to produce increased runoff. Summer and fall floods also occur due to hurricane activity.

2.4 Flood Protection Measures

There are no flood protection measures located within the Town of Westerlo. The Basic Creek Reservoir was formed with a fixed concrete spillway and is used for water supply purposes only.

Non-structural measures of flood protection are being utilized to aid in the prevention of future flood damage. These measures are in the form of land use regulations that control building within areas that have a high risk of flooding.

3.0 ENGINEERING METHODS

For the flooding sources studied in detail in the community, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this study. Flood events of a magnitude which are expected to be equaled or exceeded once on the average during any 10-, 50-, 100-, or 500-year period (recurrence interval) have been selected as having special significance for floodplain management and for flood insurance rates. These events, commonly termed the 10-, 50-, 100-, and 500-year floods, have a 10, 2, 1, and 0.2 percent chance, respectively, of being equaled or exceeded during any year. Although the recurrence interval represents the long term average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than 1 year are considered. For example, the risk of having a flood which equals or exceeds the 100-year flood (1 percent chance of annual exceedence) in any 50-year period is approximately 40 percent (4 in 10), and, for any 90-year period, the risk increases to approximately 60 percent (6 in 10). The analyses reported herein reflect flooding potentials based on conditions existing in the community at the time of completion of this study. Maps and flood elevations will be amended periodically to reflect future changes.

3.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish the peak discharge-frequency relationships for each flooding source studied in detail affecting the community.

The study streams within the Town of Westerlo are large, rural basins. A nearby stream, Coeymans Creek, has 10 years of systematic gage data; Basic Creek, Eightmile Creek, and Hannacrois Creek are ungaged. Two regional analyses were considered for use in computing peak discharges for this study. A U. S. Army Corps of Engineers (COE) Regional Frequency Analysis used gage data throughout the Upper Delaware and Hudson River basins to formulate regression equations for computing peak discharges for ungaged streams (Reference 3). The parameters of drainage area, mean annual flood peak, standard deviation, and skew are used in the regression equations. A USGS regional frequency analysis used gage data throughout New York State to formulate regression equations using the parameters of drainage area, average basin slope, and mean annual precipitation (Reference 4). These two methods were used to compute peak discharges on Coeymans Creek. These results were compared with flows computed by a log-Pearson Type III analysis of USGS gage data (Reference 5). It was discovered that an average of the two methods gave results that matched gaged flows. This average of the two regional analysis methods was, therefore, used to compute peak discharges for the ungaged streams within the study area.

A summary of the drainage area-peak discharge relationships for the streams studied by detailed methods is shown in Table 1, "Summary of Discharges."

TABLE 1 - SUMMARY OF DISCHARGES

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGES (cfs) 10-YEAR	50-YEAR	100-YEAR	500-YEAR
BASIC CREEK					
At the downstream corporate limits	24.8	1,100	2,030	2,620	4,260
At upstream side of confluence of Wolf Fly Creek	18.0	860	1,590	2,060	3,350
Approximately 1,000 feet downstream of Basic Creek Reservoir Dam	16.3	800	1,480	1,910	3,110
At upstream side of confluence with Basic Creek Reservoir	14.5	990	1,770	2,200	3,490
Approximately 0.5 mile downstream of Lobdell Mill Road	12.5	890	1,580	1,970	3,120
Approximately 460 feet upstream of Lobdell Mill Road	11.2	820	1,460	1,810	2,880

TABLE 1 - SUMMARY OF DISCHARGES - continued

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGES (cfs) 10-YEAR	50-YEAR	100-YEAR	500-YEAR
BASIC CREEK (continued)					
Approximately 100 feet downstream of County Route 401	10.6	780	1,400	1,740	2,760
Approximately 1,360 feet upstream of County Route 1	5.96	480	890	1,120	1,820
Approximately 0.9 mile upstream of County Route 1	3.81	340	640	800	1,300
Approximately 1.0 mile upstream of County Route 1	3.36	310	580	730	1,190
Approximately 1.0 mile downstream of State Route 85	2.93	280	520	660	1,070
EIGHTMILE CREEK					
At downstream corporate limits	11.5	850	1,510	1,880	2,930
Approximately 1,815 feet downstream of Pine Valley Road	9.15	720	1,270	1,580	2,470
Approximately 300 feet downstream of County Route 405	8.14	660	1,170	1,450	2,260
Approximately 300 feet downstream of second County Route 402 crossing	6.97	580	1,040	1,290	2,010
HANNACROIS CREEK					
At downstream corporate limits	17.5	1,230	2,160	2,670	4,090
At upstream side of confluence of Silver Creek	13.1	990	1,740	2,150	3,290
Approximately 0.4 mile downstream of County Route 312	11.2	880	1,550	1,910	2,930
Approximately 200 feet downstream of Tan Hollow Road	9.76	790	1,390	1,720	2,640
Approximately 1,830 feet upstream of Tan Hollow Road	4.28	390	710	890	1,430

TABLE 1 - SUMMARY OF DISCHARGES - continued

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGES (cfs) 10-YEAR	50-YEAR	100-YEAR	500-YEAR
HANNACROIS CREEK (continued)					
Approximately 1,100 feet upstream of Dunbar Hollow Road	3.79	360	650	810	1,310
Approximately 0.5 mile upstream of Dunbar Hollow Road	2.91	290	530	670	1,070

3.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of flooding from the sources studied were carried out to provide estimates of the elevations of floods of the selected recurrence intervals.

Cross sections for the backwater analyses of the streams studied by detailed methods were obtained from aerial photographs at a scale of 1:9,600, and topographic maps at a scale of 1:4,800 with a contour interval of 4 feet (References 6 and 7). Below-water sections were obtained by field measurement. All bridges and culverts were field surveyed to obtain elevation data and structural geometry.

Locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles (Exhibit 1). For stream segments for which a floodway was computed (Section 4.2), selected cross-section locations are also shown on the Flood Insurance Rate Map (Exhibit 2). Along certain portions of Basic Creek, a profile base line is shown on the maps to represent channel distances as indicated on the flood profiles and floodway data tables.

Water-surface elevations of floods of the selected recurrence intervals were computed using the COE HEC-2 step-backwater computer program (Reference 8). Flood profiles were drawn showing computed water-surface elevations for floods of the selected recurrence intervals. Starting water-surface elevations for Basic Creek and Eightmile Creek were determined using the slope/area method. Hannacrois Creek was started at critical depth.

Channel roughness factors (Manning's "n") used in the hydraulic computations for the streams studied by detailed methods were chosen by engineering judgement and based on field observations of the streams and floodplain areas. For Basic Creek, the channel "n" values ranged from 0.03 to 0.045, and the overbank "n" values ranged

from 0.05 to 0.09. For Eightmile Creek, the channel "n" values ranged from 0.03 to 0.04, and the overbank "n" values ranged from 0.06 to 0.12. For Hannacrois Creek, the channel "n" values ranged from 0.02 to 0.05, and the overbank "n" values ranged from 0.08 to 0.15. An "n" value of 0.015 was used for concrete structures and 0.024 was used for corrugated metal pipes. A weighted average "n" value was used for bridges with steel decks, concrete abutments and disregarded by using extremely high "n" values. The acceptability of all assumed hydraulic factors, cross sections, and hydraulic structures data were checked by calibrating computed flood profiles to known historic flood profiles.

The hydraulic analyses for this study were based on unobstructed flow. The flood elevations shown on the profiles are thus considered valid only if hydraulic structures remain unobstructed, operate properly, and do not fail.

All elevations are referenced to the National Geodetic Vertical Datum of 1929 (NGVD). Elevation reference marks used in this study are shown on the maps; the descriptions of the marks are presented in Elevation Reference Marks (Exhibit 3).

4.0 FLOODPLAIN MANAGEMENT APPLICATIONS

The NFIP encourages State and local governments to adopt sound floodplain management programs. Therefore, each Flood Insurance Study provides 100-year flood elevations and delineations of the 100- and 500-year floodplain boundaries and 100-year floodway to assist in developing floodplain management measures.

4.1 Floodplain Boundaries

To provide a national standard without regional discrimination, the 1 percent annual chance (100-year) flood has been adopted by FEMA as the base flood for floodplain management purposes. The 0.2 percent annual chance (500-year) flood is employed to indicate additional areas of flood risk in the community. For the streams studied in detail, the 100- and 500-year floodplain boundaries have been delineated using the flood elevations determined at each cross section. Between cross sections, the boundaries were interpolated using topographic maps at a scale of 1:4,800 with a contour interval of 4 feet (Reference 7).

For the streams studied by approximate methods, the 100-year floodplain boundaries were delineated using topographic maps and the Flood Hazard Boundary Map for the Town of Westerlo (References 9 and 10).

The 100- and 500-year floodplain boundaries are shown on the Flood Insurance Rate Map (Exhibit 2). On this map, the 100-year floodplain boundary corresponds to the boundary of the areas of special flood hazards (Zones A and AE), and the 500-year floodplain boundary corresponds to the boundary of areas of moderate flood hazards. In cases where the 100- and 500-year floodplain boundaries are close together, only the 100-year floodplain boundary has been shown. Small areas within the floodplain boundaries may lie above the flood elevations but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data.

For the streams studied by approximate methods, only the 100-year floodplain boundary is shown on the Flood Insurance Rate Map (Exhibit 2).

4.2 Floodways

Encroachment on floodplains, such as structures and fill, reduces flood-carrying capacity, increases flood heights and velocities, and increases flood hazards in areas beyond the encroachment itself. One aspect of floodplain management involves balancing the economic gain from floodplain development against the resulting increase in flood hazard. For purposes of the National Flood Insurance Program, a floodway is used as a tool to assist local communities in this aspect of floodplain management. Under this concept, the area of the 100-year floodplain is divided into a floodway and a floodway fringe. The floodway is the channel of a stream, plus any adjacent floodplain areas, that must be kept free of encroachment so that the 100-year flood can be carried without substantial increases in flood heights. Minimum federal standards limit such increases to 1.0 foot, provided that hazardous velocities are not produced. The floodways in this study are presented to local agencies as a minimum standard that can be adopted directly or that can be used as a basis for additional floodway studies.

The floodways presented in this study were computed for certain stream segments on the basis of equal conveyance reduction from each side of the floodplain. Floodway widths were computed at cross sections. Between cross sections, the floodway boundaries were interpolated. The results of the floodway computations are tabulated for selected cross sections (Table 2). The computed floodways are shown on the Flood Insurance Rate Map (Exhibit 2). In cases where the floodway and 100-year floodplain boundaries are either close together or collinear, only the floodway boundary is shown.

The area between the floodway and 100-year floodplain boundaries is termed the floodway fringe. The floodway fringe encompasses the portion of the floodplain that could be completely obstructed without increasing the water-surface elevation of the 100-year flood

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
					(FEET NGVD)			
Basic Creek								
A	400	136	539	4.9	769.9	769.9	770.8	0.9
B	2,000	133	541	4.8	785.7	785.7	786.5	0.8
C	3,900	126	334	6.2	808.8	808.8	809.8	1.0
D	5,280	43	191	10.8	830.0	830.0	830.0	0.0
E	6,600	118	316	6.5	851.9	851.9	852.5	0.6
F	8,100	65	261	7.9	873.8	873.8	873.8	0.0
G	9,700	43	244	8.4	885.6	885.6	886.5	0.9
H	11,800	72	313	6.6	907.0	907.0	907.5	0.5
I	13,800	80	457	4.5	924.1	924.1	924.6	0.5
J	15,050	240	1,127	1.8	925.8	925.8	926.6	0.8
K	16,100	261	1,468	1.4	926.5	926.5	927.5	1.0
L	17,600	156	642	3.0	927.2	927.2	928.2	1.0
M	23,500	290	1,375	1.6	941.6	941.6	942.5	0.9
N	25,500	441	1,675	1.3	945.3	945.3	946.3	1.0
O	27,400	78	290	7.6	961.8	961.8	962.6	0.8
P	29,400	59	251	8.8	986.3	986.3	986.3	0.0
Q	31,500	78	338	6.5	1,014.0	1,014.0	1,014.7	0.7
R	33,300	83	272	7.2	1,043.6	1,043.6	1,043.6	0.0
S	35,100	88	253	7.2	1,086.1	1,086.1	1,087.0	0.9
T	37,100	52	301	6.0	1,110.7	1,110.7	1,111.1	0.4
U	39,100	109	774	2.3	1,125.7	1,125.7	1,126.7	1.0
V	41,000	149	719	2.5	1,127.5	1,127.5	1,128.5	1.0
W	42,600	40	212	8.2	1,131.9	1,131.9	1,132.9	1.0
X	44,800	48	192	9.1	1,149.6	1,149.6	1,149.6	0.0
Y	46,200	148	303	3.7	1,159.4	1,159.4	1,160.4	1.0
Z	47,000	41	143	7.9	1,166.7	1,166.7	1,167.4	0.7

[1] Feet above corporate limits

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF WESTERLO, NY

(ALBANY CO.)

FLOODWAY DATA

BASIC CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
					(FEET NGVD)			
Basic Creek (continued)								
AA	49,100	33	117	6.8	1,192.1	1,192.1	1,193.1	1.0
AB	51,400	36	97	7.5	1,233.6	1,233.6	1,234.4	0.8
AC	53,200	31	87	7.6	1,274.4	1,274.4	1,274.8	0.4
AD	55,320	45	335	2.0	1,323.9	1,323.9	1,324.6	0.7
AE	56,800	38	118	5.6	1,340.1	1,340.1	1,341.1	1.0
AF	57,800	21	76	8.7	1,354.0	1,354.0	1,354.0	0.0
Eightmile Creek								
A	300	80	609	3.1	961.0	961.0	961.9	0.9
B	1,700	249	1,139	1.7	961.5	961.5	962.4	0.9
C	3,200	74	276	5.7	975.4	975.4	976.2	0.8
D	4,600	67	355	4.4	995.1	995.1	995.6	0.5
E	6,100	79	233	6.8	1,009.1	1,009.1	1,009.6	0.5
F	7,000	148	328	4.8	1,023.9	1,023.9	1,024.9	1.0
G	7,670	71	223	7.1	1,037.3	1,037.3	1,038.0	0.7
H	9,250	77	243	6.0	1,068.3	1,068.3	1,068.3	0.0
I	10,750	76	270	5.4	1,100.7	1,100.7	1,100.7	0.0
J	12,000	64	201	7.2	1,130.3	1,130.3	1,130.3	0.0
K	12,400	40	162	9.0	1,141.6	1,141.6	1,141.8	0.2
L	13,350	73	470	3.1	1,146.0	1,146.0	1,146.6	0.6
M	14,250	97	261	5.5	1,159.2	1,159.2	1,160.2	1.0
N	15,650	65	211	6.9	1,193.6	1,193.6	1,193.9	0.3
O	17,250	33	190	6.8	1,222.8	1,222.8	1,222.8	0.0
P	17,810	96	225	5.7	1,228.5	1,228.5	1,228.6	0.1
Q	18,650	164	717	1.8	1,229.8	1,229.8	1,230.2	0.4

[1]Feet above corporate limits

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF WESTERLO, NY

(ALBANY CO.)

FLOODWAY DATA

BASIC CREEK - EIGHTMILE CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
					(FEET NGVD)			
Eightmile Creek (continued)								
R	19,300	75	197	6.6	1,230.6	1,230.6	1,231.0	0.4
S	19,800	81	199	6.5	1,238.4	1,238.4	1,238.4	0.0
T	21,300	70	205	6.3	1,267.0	1,267.0	1,267.0	0.0
Hannacrois Creek								
A	600	66	418	6.4	634.4	634.4	634.6	0.2
B	3,000	53	310	6.9	721.6	721.6	722.3	0.7
C	4,400	147	549	3.9	728.3	728.3	729.0	0.7
D	6,100	136	649	3.3	734.6	734.6	735.5	0.9
E	7,900	62	354	6.1	747.8	747.8	747.8	0.0
F	9,900	454	1,093	2.0	753.8	753.8	754.8	1.0
G	11,100	123	377	5.1	765.0	765.0	765.9	0.9
H	12,100	48	207	9.2	772.7	772.7	773.7	1.0
I	13,700	45	244	7.8	786.4	786.4	787.3	0.9
J	15,300	38	259	7.4	796.8	796.8	797.7	0.9
K	16,750	215	698	2.7	806.3	806.3	806.9	0.6
L	17,900	40	185	9.3	816.8	816.8	816.9	0.1
M	19,700	36	125	7.1	839.8	839.8	840.5	0.7
N	21,150	29	119	7.5	857.6	857.6	858.2	0.6
O	21,800	108	668	1.3	864.2	864.2	865.0	0.8
P	23,250	189	419	1.9	868.8	868.8	869.8	1.0
Q	24,300	86	215	3.1	876.7	876.7	877.6	0.9
R	25,400	222	351	1.9	883.5	883.5	884.5	1.0

[1] Feet above corporate limits

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

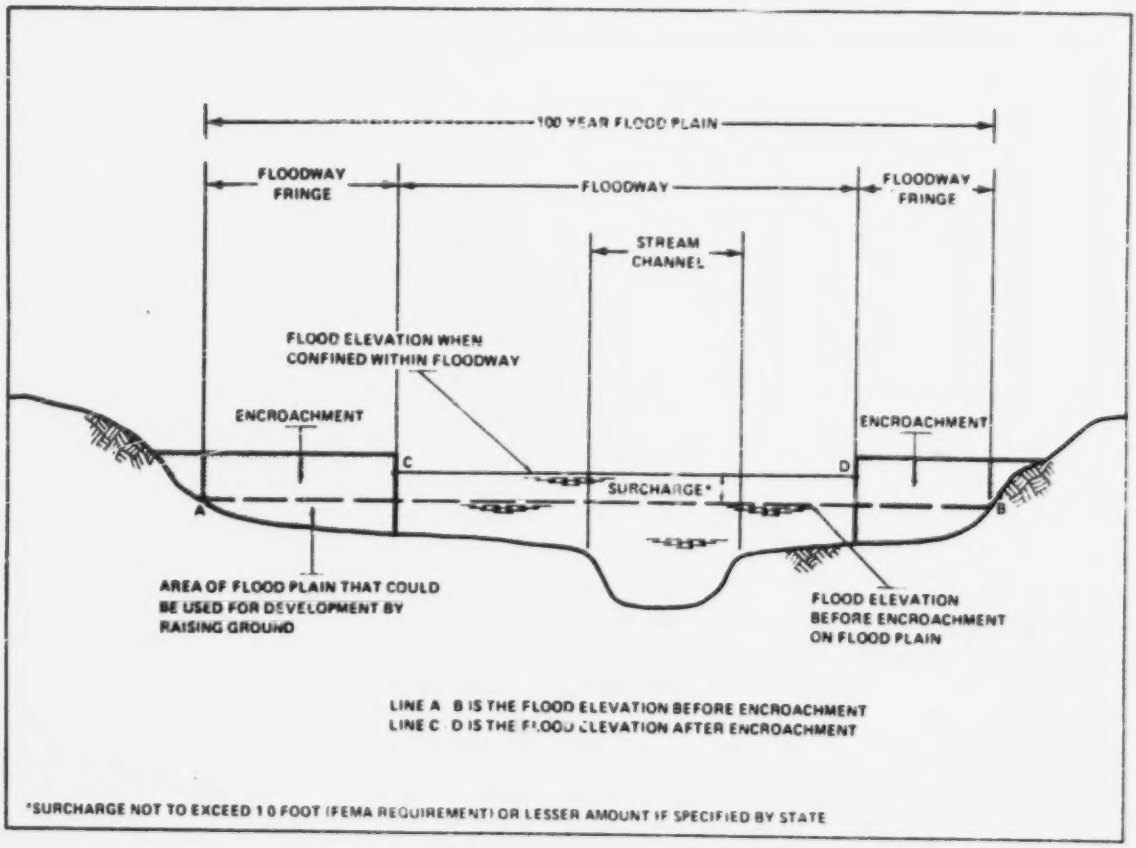
TOWN OF WESTERLO, NY

(ALBANY CO.)

FLOODWAY DATA

EIGHTMILE CREEK - HANNACROIS CREEK

by more than 1.0 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to floodplain development are shown in Figure 2.


100 YEAR FLOOD PLAIN
FLOODWAY FRINGE
FLOODWAY
FLOODWAY FRINGE
STREAM CHANNEL
FLOOD ELEVATION WHEN CONFINED WITHIN FLOODWAY
ENCROACHMENT
ENCROACHMENT
C
D
SURCHARGE*
A
B
AREA OF FLOOD PLAIN THAT COULD BE USED FOR DEVELOPMENT BY RAISING GROUND
FLOOD ELEVATION BEFORE ENCROACHMENT ON FLOOD PLAIN
LINE A B IS THE FLOOD ELEVATION BEFORE ENCROACHMENT
LINE C D IS THE FLOOD ELEVATION AFTER ENCROACHMENT
*SURCHARGE NOT TO EXCEED 1.0 FOOT (FEMA REQUIREMENT) OR LESSER AMOUNT IF SPECIFIED BY STATE

FLOODWAY SCHEMATIC Figure 2

5.0 INSURANCE APPLICATIONS

For flood insurance rating purposes, flood insurance zone designations are assigned to a community based on the results of the engineering analyses. The zones are as follows:

Zone A

Zone A is the flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the Flood Insurance Study by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no base flood elevations or depths are shown within this zone.

Zone AE

Zone AE is the flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the Flood Insurance Study by detailed methods. In most instances, whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone AH

Zone AH is the flood insurance rate zone that corresponds to the areas of 100-year shallow flooding (usually areas of ponding) where average depths are between 1 and 3 feet. Whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone AO

Zone AO is the flood insurance rate zone that corresponds to the areas of 100-year shallow flooding (usually sheet flow on sloping terrain) where average depths are between 1 and 3 feet. Average whole-depths derived from the detailed hydraulic analyses are shown within this zone.

Zone A99

Zone A99 is the flood insurance rate zone that corresponds to areas of the 100-year floodplain that will be protected by a Federal flood protection system where construction has reached specified statutory milestones. No base flood elevations or depths are shown within this zone.

Zone V

Zone V is the flood insurance rate zone that corresponds to the 100-year coastal floodplains that have additional hazards associated with storm waves. Because approximate hydraulic analyses are performed for such areas, no base flood elevations are shown within this zone.

Zone VE

Zone VE is the flood insurance rate zone that corresponds to the 100-year coastal floodplains that have additional hazards associated with storm waves. Whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone X

Zone X is the flood insurance rate zone that corresponds to areas outside the 500-year floodplain, areas within the 500-year floodplain,and to areas of 100-year flooding where average depths are less than 1 foot, areas of 100-year flooding where the contributing drainage area is less than 1 square mile, and areas protected from the 100-year flood by levees. No base flood elevations or depths are shown within this zone.

Zone D

Zone D is the flood insurance rate zone that corresponds to unstudied areas where flood hazards are undetermined, but possible.

6.0 FLOOD INSURANCE RATE MAP

The Flood Insurance Rate Map is designed for flood insurance and floodplain management applications.

For flood insurance applications, the map designates flood insurance rate zones as described in Section 5.0 and, in the 100-year floodplains that were studied by detailed methods, shows selected whole-foot base flood elevations or average depths. Insurance agents use the zones and base flood elevations in conjunction with information on structures and their contents to assign premium rates for flood insurance policies.

For floodplain management applications, the map shows by tints, screens, and symbols, the 100- and 500-year floodplains. Floodways and the locations of selected cross sections used in the hydraulic analyses and floodway computations are shown where applicable.

7.0 OTHER STUDIES

A Flood Insurance Study has been prepared for the Town of Rensselaerville (Reference 11). The results of this study do not agree with the results of that study due to the more up-to-date nature of this study.

A Flood Insurance Study for the Town of Coeymans is currently being prepared (Reference 12). Because the results of this study are based on more detailed analyses, the results of the Coeymans study will not be in complete agreement with this study.

Due to its more detailed nature, this study supersedes the Flood Hazard Boundary Map for the Town of Westerlo (Reference 10).

8.0 LOCATION OF DATA

Information concerning the pertinent data used in preparation of this study can be obtained by contacting FEMA, the Natural and Technological Hazards Division, 26 Federal Plaza, Room 1351, New York, New York 10278.

9.0 BIBLIOGRAPHY AND REFERENCES

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2. U. S. Department of Commerce, National Oceanic and Atmospheric Administration, Climatography of the United States No. 20, Asheville, North Carolina, National Climatic Center, December 1975.

3. U. S. Army Corps of Engineers, Hydrologic Engineering Center, Regional Frequency Study, Upper Delaware and Hudson River Basins, New York District, Davis, California, November 1974.

4. U. S. Department of the Interior, Geological Survey, Techniques for Estimating Magnitude and Frequency of Floods on Rural Unregulated Streams in New York State Excluding Long Island by Thomas J. Zembrzuske Jr., and Bernard Dunn, Albany, New York, 1979.

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8. U. S. Army Corps of Engineers, Hydrologic Engineering Center, HEC-2 Water Surface Profiles, Generalized Computer Program, Davis, California, October 1983, updated April 1980.

9. U. S. Department of the Interior, Geological Survey, 7.5-Minute Series Topographic Maps, Scale 1:24,000, Contour Interval 10 Feet: Alcove, New York, 1953, Photorevised 1980; Clarksville, New York, 1953, Photorevised 1980; Greenville, New York, 1945, Photorevised 1980; Westerlo, New York, 1943, Photorevised 1980.

10. U. S. Department of Housing and Urban Development, Federal Insurance Administration, Flood Hazard Boundary Map, Town of Westerlo, Albany County, New York, July 30, 1976.

11. Federal Emergency Management Agency, Flood Insurance Study, Town of Rensselaerville, Albany County, New York, Washington, D. C., August 27, 1982.

12. Federal Emergency Management Agency, Flood Insurance Study, Town of Coeymans, Albany County, New York (Unpublished).

Chow, Ven Te, Open-Channel Hydraulics, New York, McGraw-Hill, 1959.

U. S. Department of Commerce, Weather Bureau, Technical Paper No. 40, Rainfall Frequency Atlas of the United States, Washington, D. C., 1961, Revised 1963.

EXHIBIT 3 - ELEVATION REFERENCE MARKS

Reference Mark	FIRM Panel	Elevation (Feet NGVD)	Description of Location
RM 1	04	1,372.23	X cut on top of eastern most bolt of north headwall of State Route 85 bridge over Basic Creek.
RM 2	04	1,325.15	PK nail 0.5 feet up utility pole number 132171 at northwest corner of intersection of Access Road and State Route 143, approximately 0.6 mile south of intersection of State Routes 85 and 143.
RM 3	12	1,272.85	PK nail 1 foot up utility pole number 19270 on west side of State Route 143, approximately 700 feet south of intersection of State Route 143 and County Route 36.
RM 4	12	1,146.28	USGS disk, stamped Westerlo 1942 at southwest concrete abutment of County Route 1 bridge over Basic Creek.
RM 5	13	1,237.91	Box cut on northwest corner of northwest headwall of County Route 402 bridge over Eightmile Creek, approximately 800 feet northwest of County Route 402 and Johnny Cake Hill Road intersection.
RM 6	14	1,135.36	Box cut on southwest corner of east headwall of County Route 401 bridge over Basic Creek.
RM 7	14	1,121.30	Box cut on northwest corner of west concrete headwall of culvert, approximately 175 feet southeast of intersection of Lobdell Mill Road and County Route 401.
RM 8	14	1,082.60	Box cut on northwest corner of west concrete abutment of Lobdell Mill Road bridge over Basic Creek.
RM 9	14	1,061.44	PK nail 1 foot up pole number 50756 on east side of Lobdell Mill Road, approximately 0.9 mile east of intersection of Lobdell Mill Road and County Road 401.

EXHIBIT 3 - ELEVATION REFERENCE MARKS - continued

Reference Mark	FIRM Panel	Elevation (Feet NGVD)	Description of Location
RM 10	16	917.69	PK nail 0.5 foot up north gate post on Hidden Valley Shooting Preserve entrance road off Dunbar Hollow Road, approximately 200 feet north of intersection of Derbyshire Road and Dunbar Hollow Road.
RM 11	16	861.49	Box cut on north end of flat stone on southeast side of east headwall of Dunbar Hollow Road bridge over Hannacrois Creek.
RM 12	16	815.87	Box cut on northeast wing wall of concrete Tan Hollow Road bridge over Hannacrois Creek.
RM 13	18	784.89	Box cut on northeast headwall on west side of County Route 312 bridge, approximately 325 feet south of intersection of County Route 312 and Tan Hollow Road.
RM 14	18	819.84	PK nail 1 foot up pole on south side of County Route 312 at intersection of County Route 312 and Hilson Road.
RM 15	18	734.46	USGS disk, stamped V-274-Reset 1981 on northwest corner of headwall of State Route 32/143 bridge over Hannacrois Creek.
RM 16	21	1,224.28	Box cut on southeast corner of east headwall of County Route 402 box culvert over Eightmile Creek, approximately 300 feet northwest of intersection of County Routes 402 and 404.
RM 17	21	1,187.85	Box cut on east end of south headwall of County Route 402 bridge over Eightmile Creek, approximately 1,600 feet southwest of intersection of County Routes 402 and 404.
RM 18	21	1,168.49	PK nail 1 foot up utility pole opposite house number 3044 on north side of County Route 402, approximately 400 feet east of intersection of County Route 402 and County Route 408.

EXHIBIT 3 - ELEVATION REFERENCE MARKS - continued

Reference Mark	FIRM Panel	Elevation (Feet NGVD)	Description of Location
RM 19	21	1,184.63	PK nail 1 foot up utility pole number 22 on northwest side of County Route 402, approximately 1,900 feet west of intersection of County Route 402 and County Route 408.
RM 20	21	1,046.33	X cut on flat rock at middle of south headwall between two large culverts on County Route 405 bridge over Eightmile Creek.
RM 21	22	942.05	Box cut on southeast corner of concrete anchor at west end of south guide rail on County Route 404 causeway over Basic Creek Reservoir.
RM 22	22	940.78	Box cut on east end of south concrete headwall of box culvert on County Route 404 causeway over Basic Creek Reservoir.
RM 23	22	940.78	Box cut on northeast corner of east concrete abutment of Basic Creek Reservoir Dam.
RM 24	22	928.96	Box cut on north end of east concrete abutment of County Route 406 bridge over Basic Creek.
RM 25	23	988.36	PK nail 1 foot up utility pole number 53918 on north side of Pine Valley Road, approximately 800 feet west of intersection with Gifford Road.
RM 26	24	976.50	PK nail 1 foot up utility pole number 74748 on west side of Creamery Road, approximately 0.9 mile northeast of intersection of Creamery Road and County Route 405.
RM 27	24	917.72	PK nail 1 foot up utility pole number 124249 on east side of County Route 401, approximately 2,200 feet southeast of intersection of County Routes 401 and 406.

EXHIBIT 3 - ELEVATION REFERENCE MARKS - continued

Reference Mark	FIRM Panel	Elevation (Feet NGVD)	Description of Location
RM 28	24	826.65	PK nail 1 foot up utility pole number 17239 on south side of County Route 403, approximately 1,000 feet southwest of intersection of County Routes 403 and 405.
RM 29	24	837.10	Box cut on east end of south concrete headwall of County Route 405 bridge over Basic Creek.

FLOOD PROFILES

BASIC CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF WESTERLO, NY

(ALBANY CO.)

01P

930
920
910
900
890
880
870
860
850
840

ELEVATION IN FEET (NGVD)

6.5 7.0 7.5 8.0 8.5 9.0 9.5 10.0 10.5 11.0 11.5 12.0 12.5 13.0

STREAM DISTANCE IN THOUSANDS OF FEET ABOVE CORPORATE LIMITS

E F G H

LEGEND

- 500 YEAR FLOOD
- 100 YEAR FLOOD
- 50 YEAR FLOOD
- 10 YEAR FLOOD
- STREAM BED
- CROSS SECTION LOCATION

FLOOD PROFILES

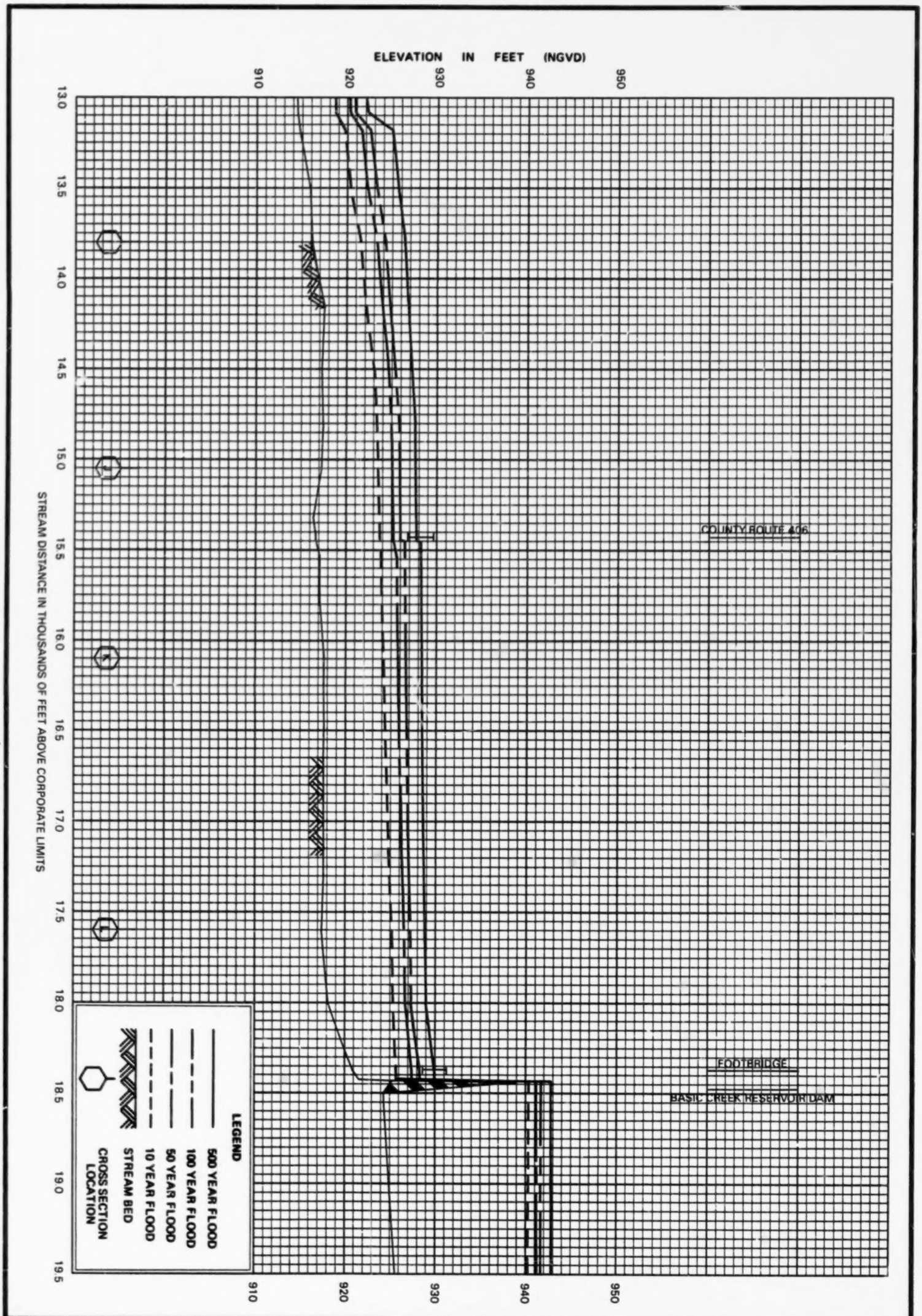
BASIC CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF WESTERLO, NY

(ALBANY CO.)

02P



FEDERAL EMERGENCY MANAGEMENT AGENCY

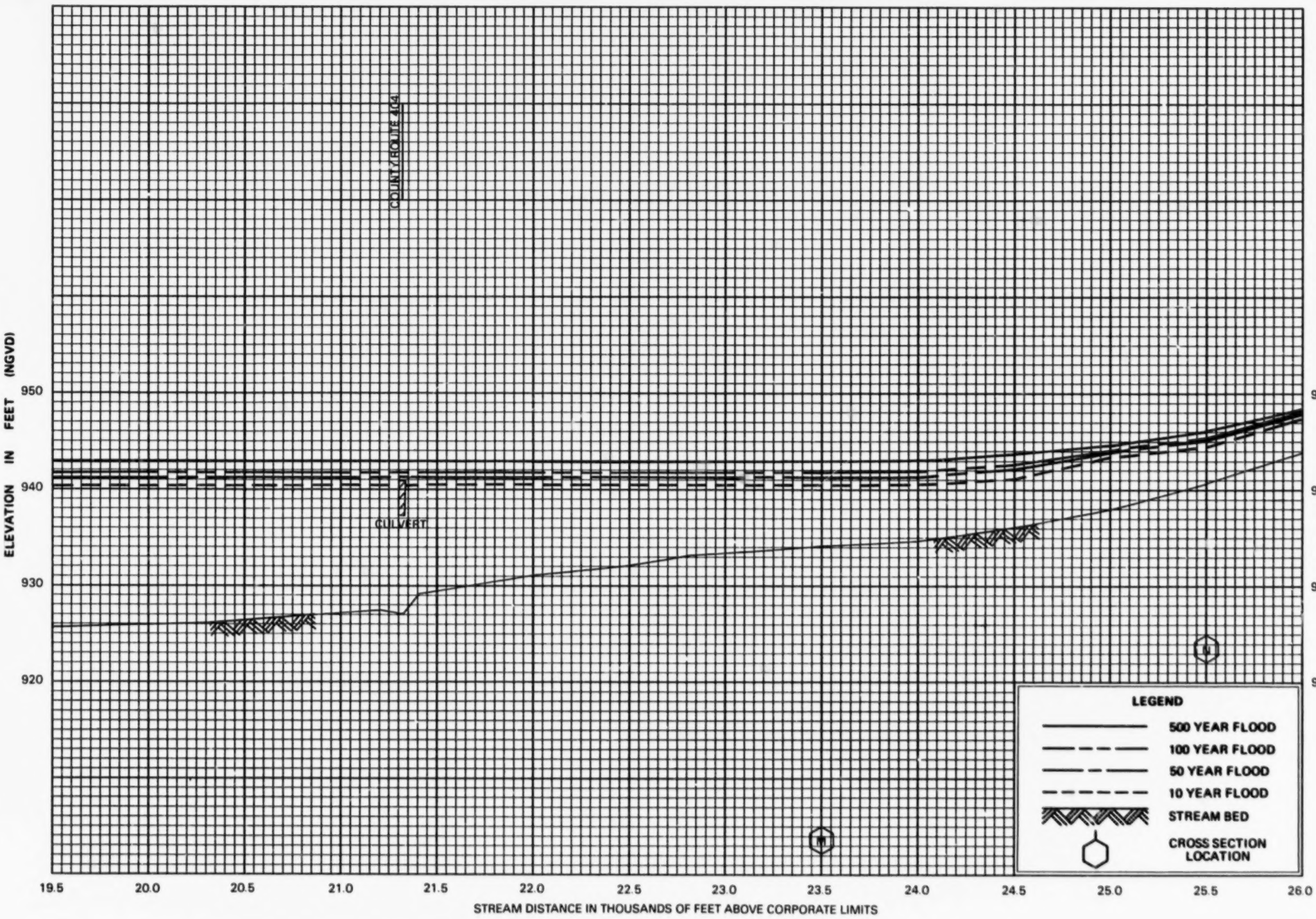
TOWN OF WESTERLO, NY

(ALBANY CO.)

FLOOD PROFILES

BASIC CREEK

03P



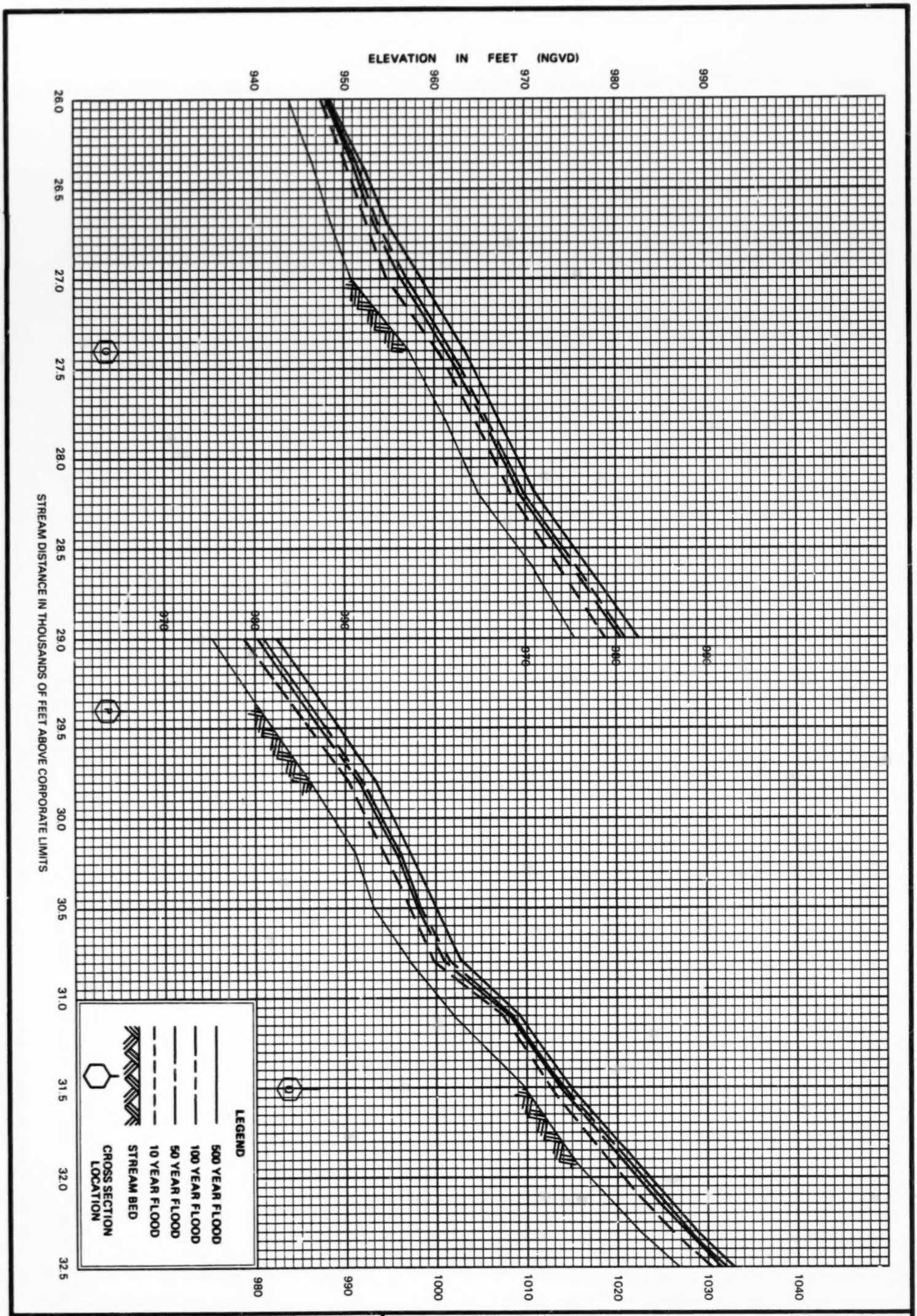
FLOOD PROFILES

BASIC CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF WESTERLO, NY
(ALBANY CO.)

04P



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FEDERAL EMERGENCY MANAGEMENT AGENCY

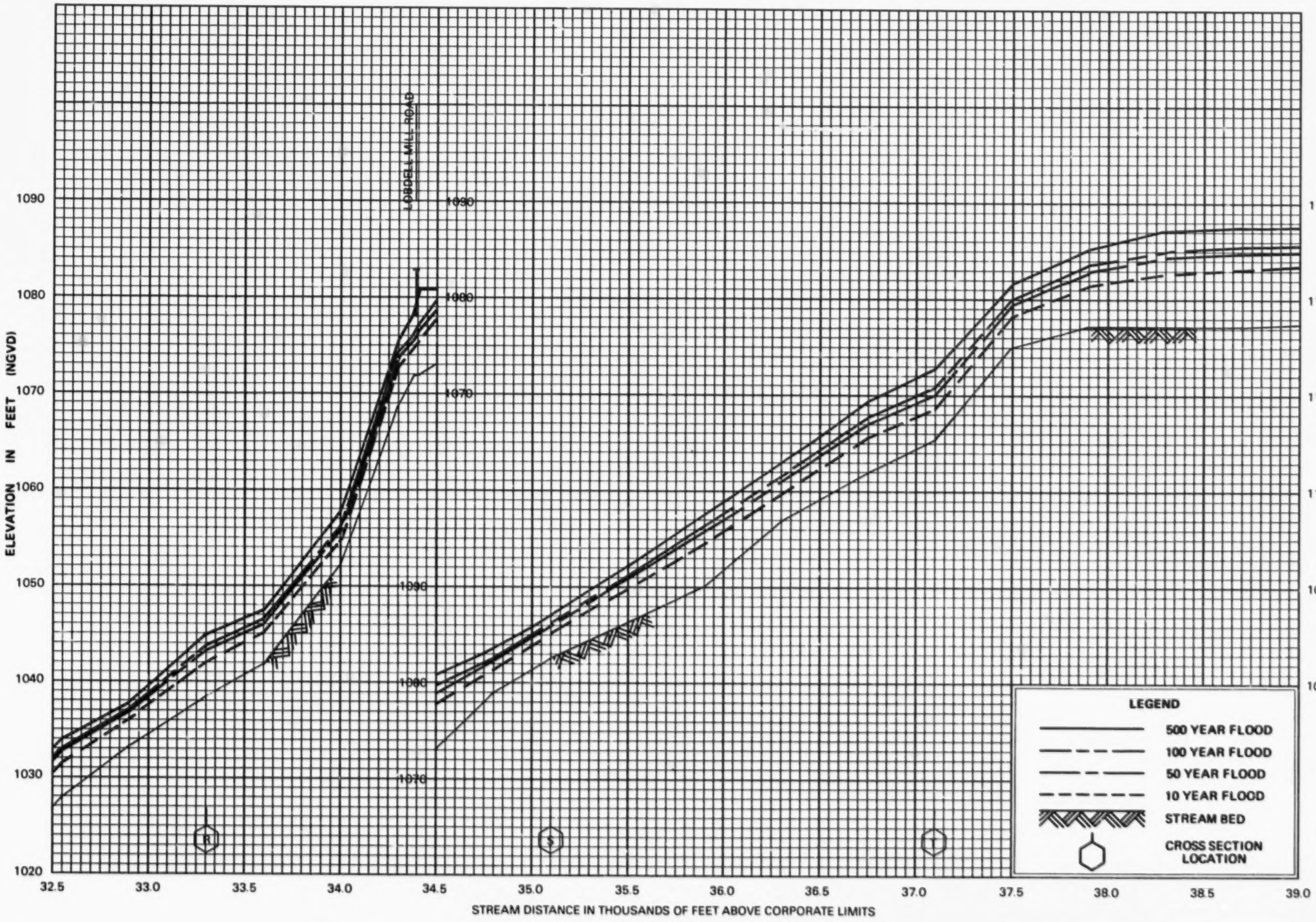
TOWN OF WESTERLO, NY

(ALBANY CO.)

FLOOD PROFILES

BASIC CREEK

26



FLOOD PROFILES

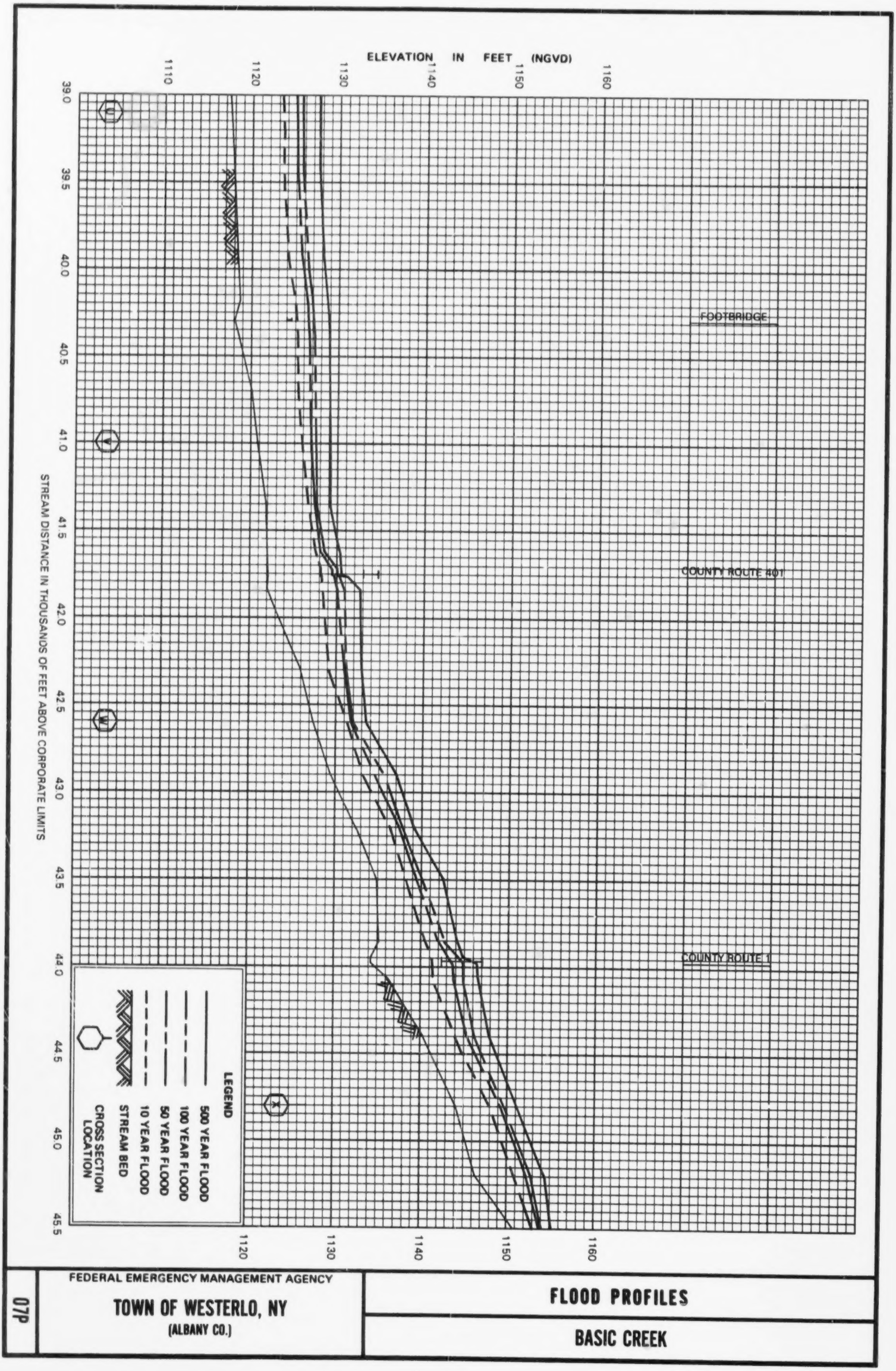
BASIC CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF WESTERLO, NY

(ALBANY CO.)

06P



FEDERAL EMERGENCY MANAGEMENT AGENCY

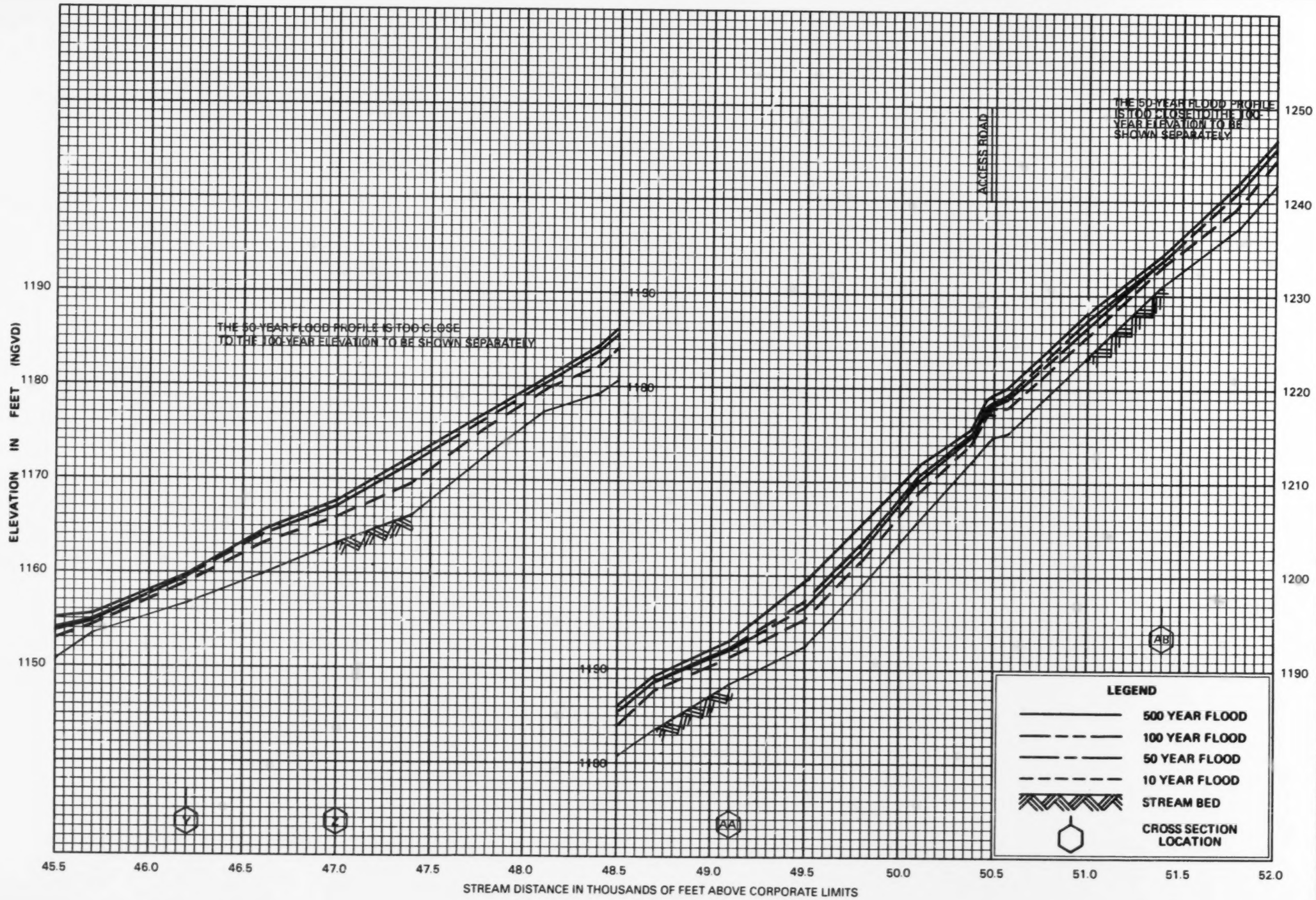
TOWN OF WESTERLO, NY

(ALBANY CO.)

FLOOD PROFILES

BASIC CREEK

07P



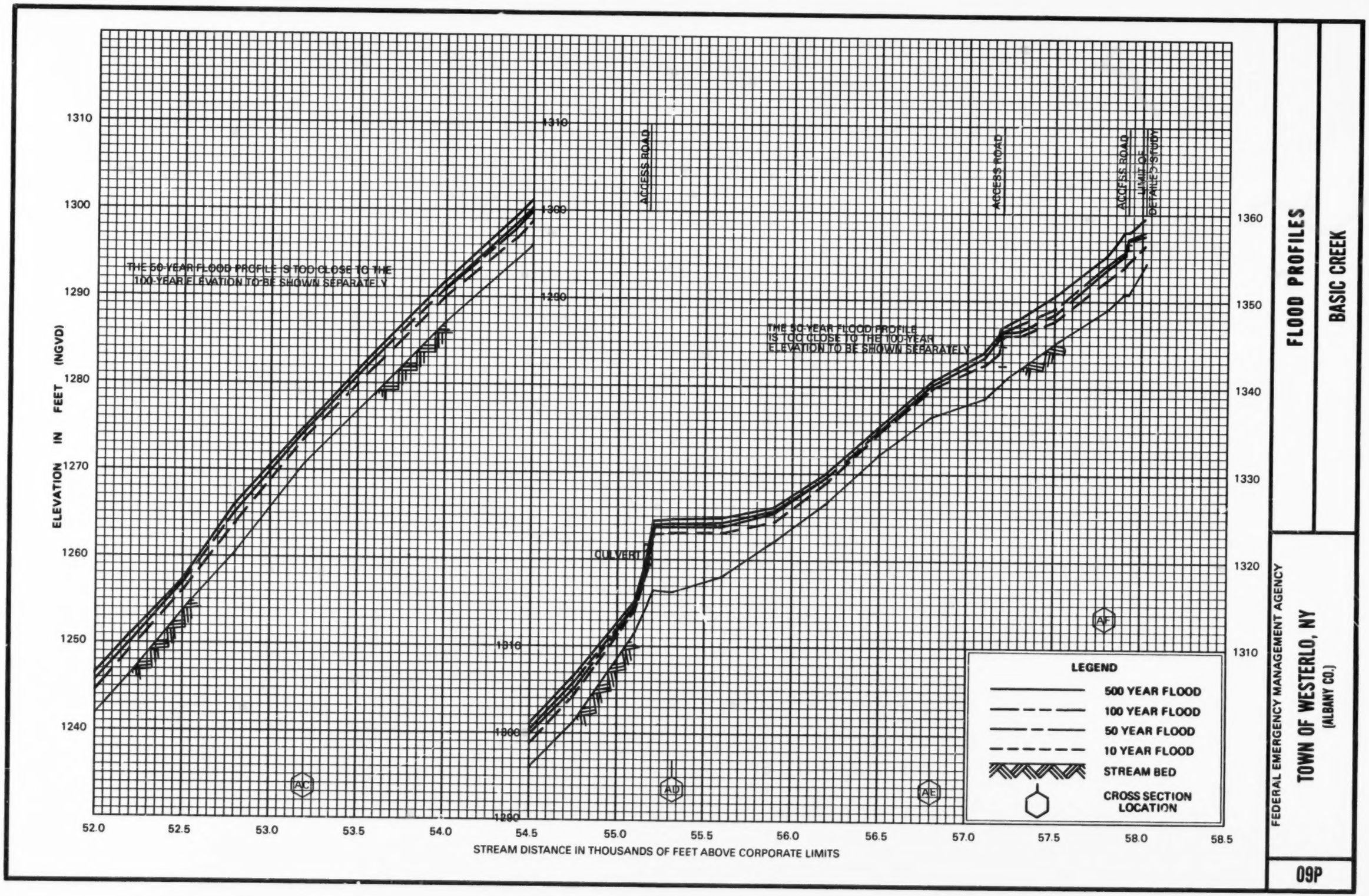
FLOOD PROFILES

BASIC CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF WESTERLO, NY
(ALBANY CO.)

08P



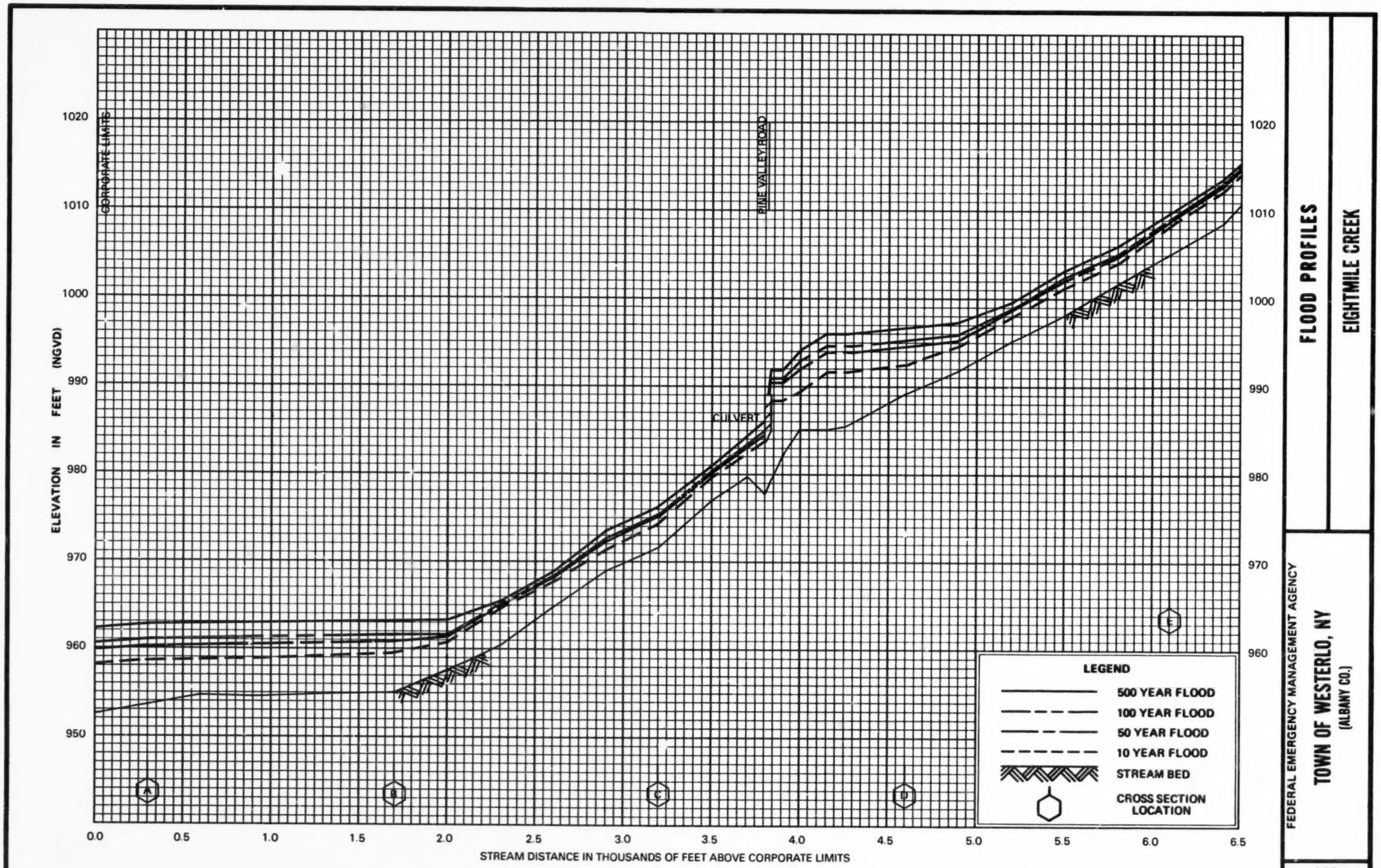
FLOOD PROFILES

BASIC CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF WESTERLO, NY
(ALBANY CO.)

09P



FLOOD PROFILES

EIGHTMILE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF WESTERLO, NY
(ALBANY CO.)

10P

FLOOD PROFILES

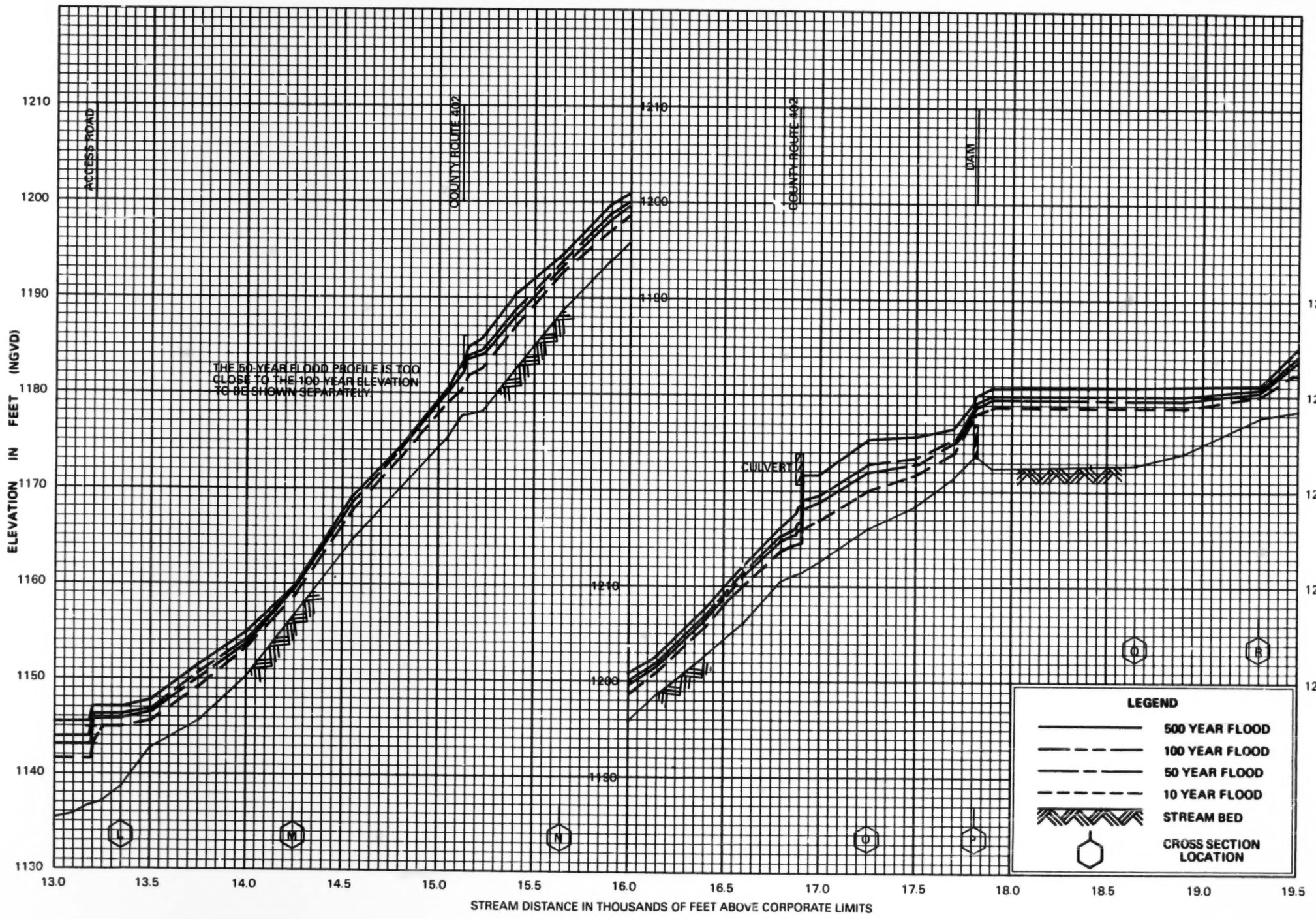
EIGHTMILE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF WESTERLO, NY

(ALBANY CO.)

11P



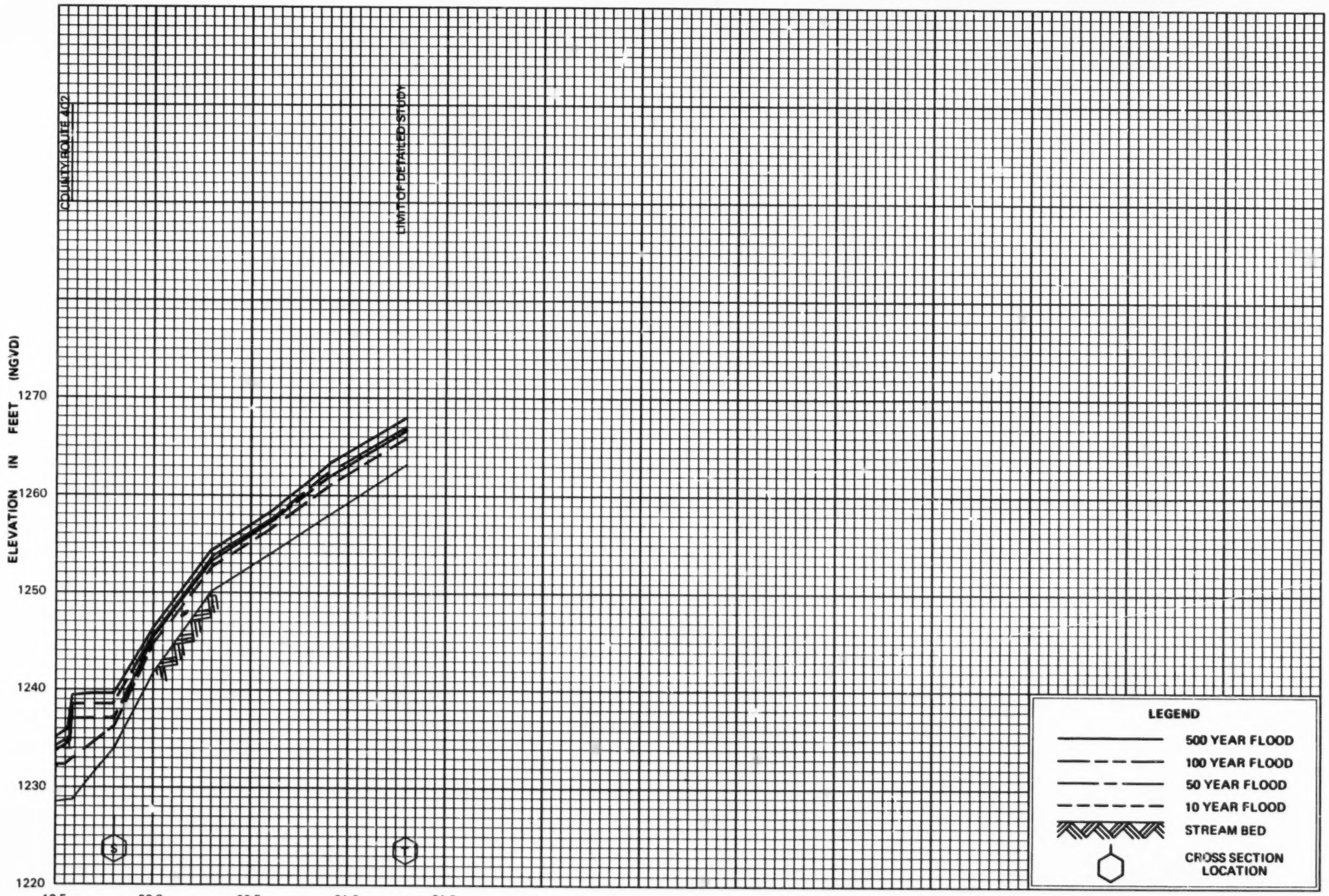
FLOOD PROFILES

EIGHTMILE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF WESTERLO, NY
(ALBANY CO.)

12P



FLOOD PROFILES

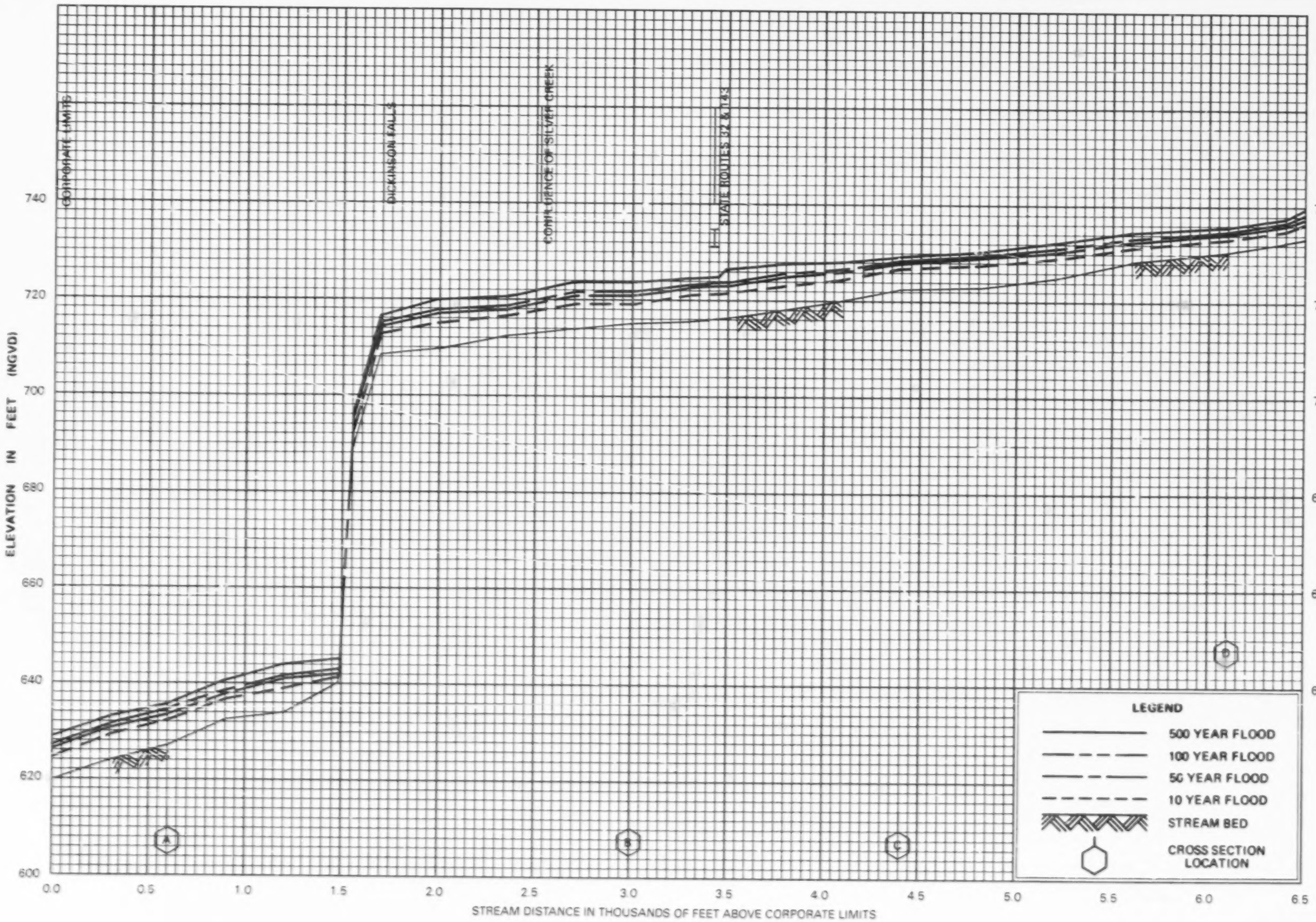
EIGHTMILE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF WESTERLO, NY

(ALBANY CO.)

13P



FLOOD PROFILES

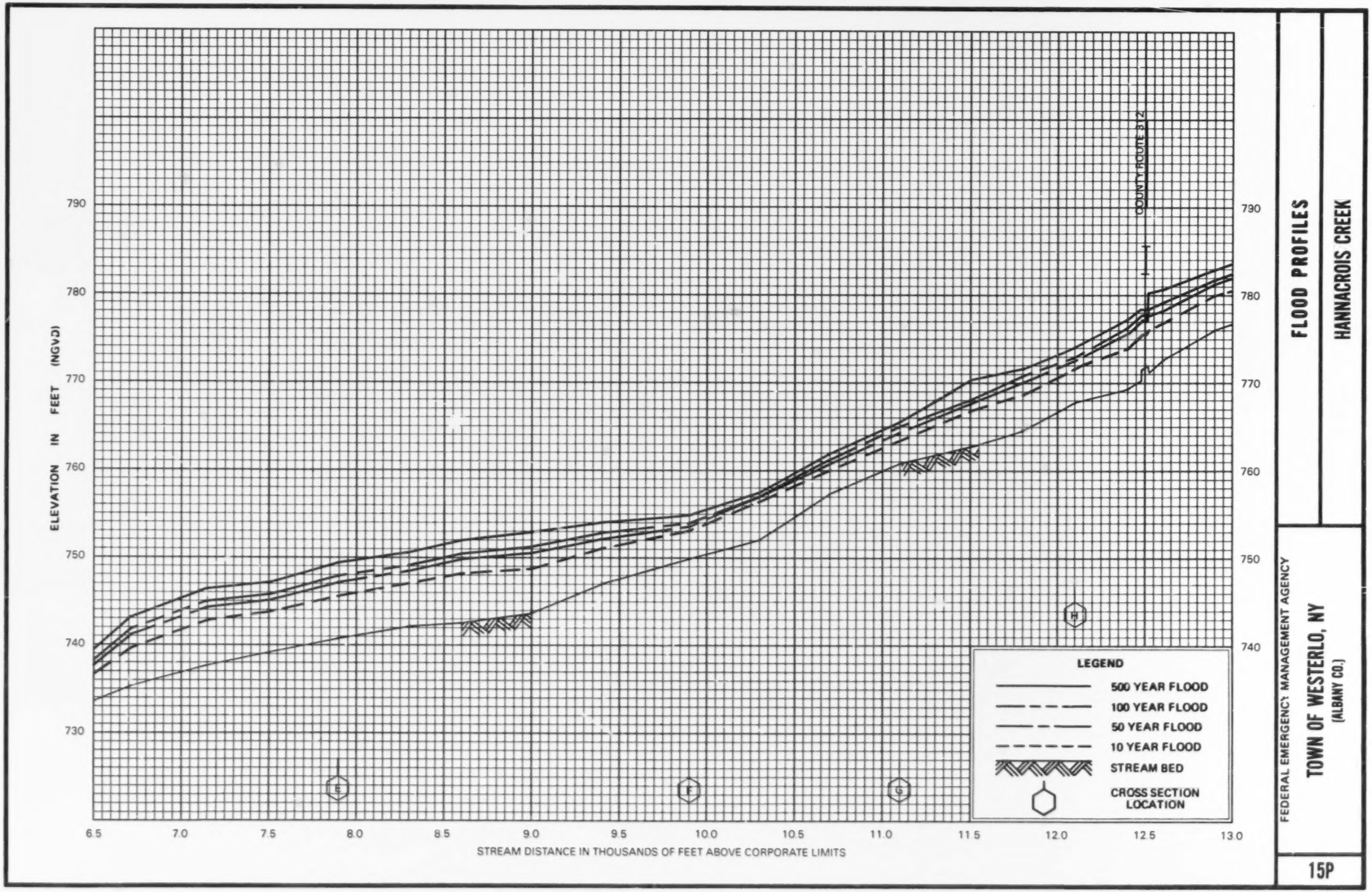
HANNACROIS CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF WESTERLO, NY

(ALBANY CO.)

14P



FLOOD PROFILES

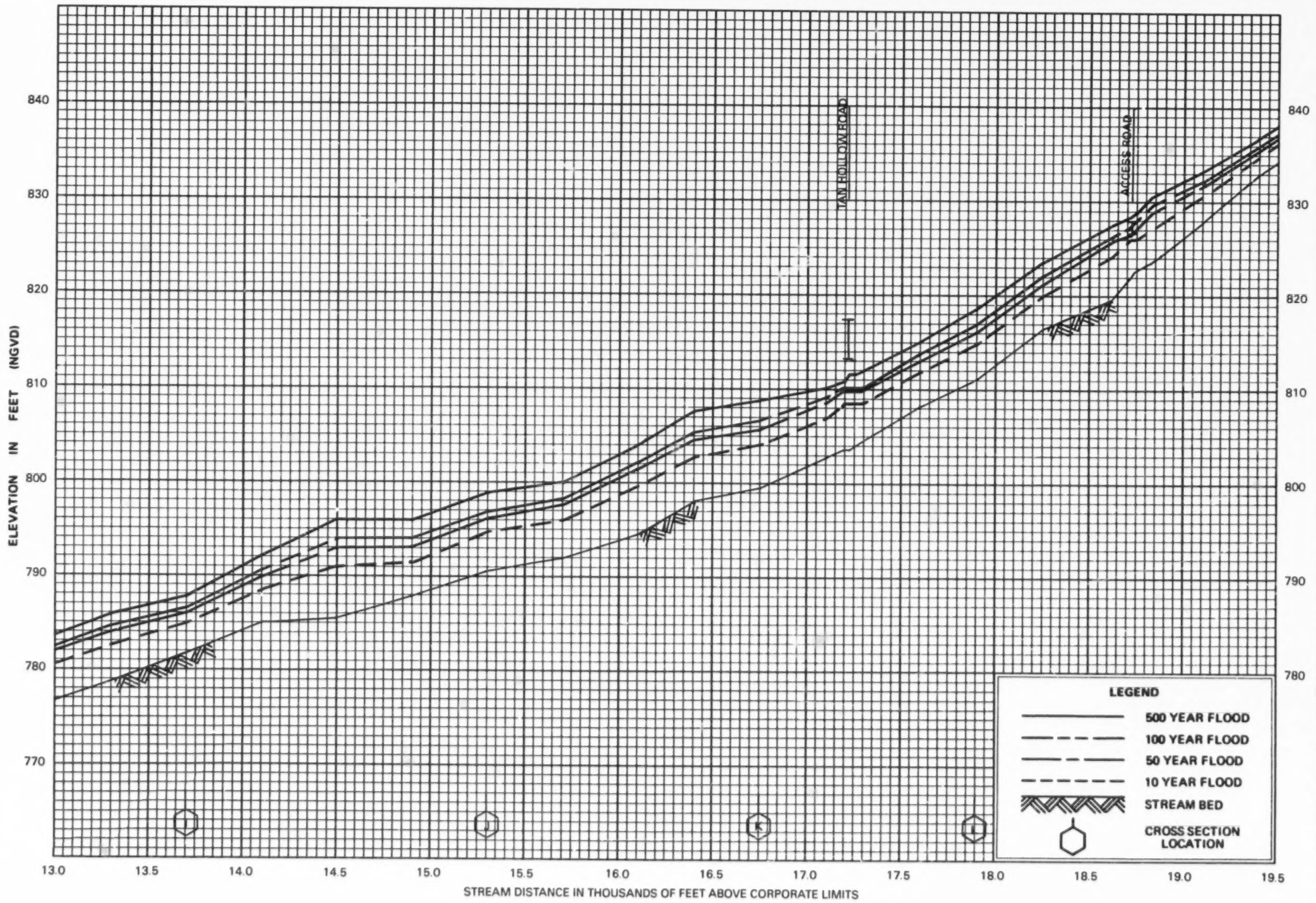
HANNACROIS CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF WESTERLO, NY

(ALBANY CO.)

15P



FLOOD PROFILES

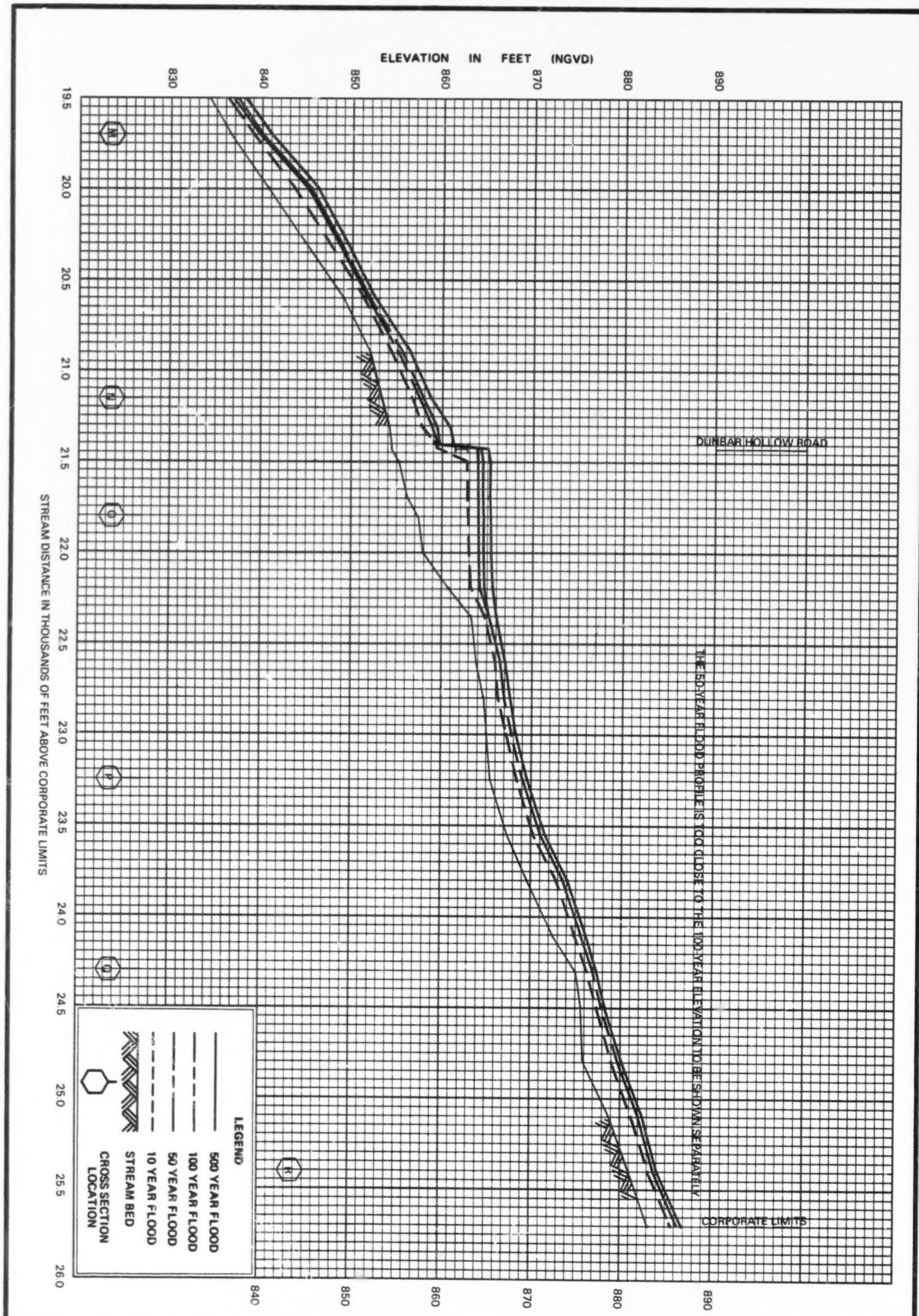
HANNACROIS CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF WESTERLO, NY

(ALBANY CO.)

16P



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